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Fisheries Investigations in the Beaver Creek Drainage, 1988

Louis Carufel

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Beaver Creek Drainage
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LOUIS CARUFEL, Bureau of Land Management, 1150 University Ave., Fairbanks, Ak., 99709-3844.

INTRODUCTION

Fisheries surveys of Beaver Creek, upstream from its confluence with Victoria Creek, were conducted by personnel from the Bureau of Land Management from June 7 to September 15, 1988. The purpose of these investigations was to carry out the objectives of the draft Aquatic Habitat Management Plan (AHMP). These objectives are (1) to monitor the effect of recreational use on the sport fishing quality, (2) inventory limnological parameters of the fishery habitat of Beaver Creek and its tributaries, and (3) monitor and plan fish enhancement for Nome Creek, a tributary of Beaver Creek.

STUDY AREA

Beaver Creek (Figure 1) originates at the confluence of Bear and Champion creeks, wild river mile 0. The first 20-mile segment consists of a narrow channel, one to three feet deep, flowing through a gravel streambed averaging 50 feet in width, with an average river gradient of eight feet per mile. Except for occasional shallow riffles, sufficent water levels are present throughout the summer season for watercraft to float this segment. In past years (USDI 1983, Webb 1982) mining in the upper tributaries of Beaver Creek provide occasional turbidity, but this section had clear water from 1988 mining in upper Nome Creek.

The stretch of river between wild river mile 20 and 100 is depicted by a widening channel that varies in width from 75 to 150 feet with depths averaging two to four feet. The average river gradient is eight feet per mile. Major drainages entering Beaver Creek in this stretch of stream include Trail, Wickersham and Fossil creeks. At several locations Beaver Creek separates into two main channels which flow separately for up to a mile. The stream substrate is a mixture of small stones, pebbles and sand. Exposed gravel bars are numerous. Water quality is generally excellent.

Major drainages entering Beaver Creek between wild river mile 50 and 99 are Willow, Sheep and Warren creeks. Stream gradient continues to average eight feet per mile as it flows through a hilly area within this stream section.

The final segment of Beaver Creek National Wild River (wild river mile 100 through 127) is characterized by a gradual reduction in gradient as the stream flows into the Yukon Flats National Wildlife Refuge at wild river mile 127. The river gradient changes from eight feet per mile at the start of this section to less than two feet per mile. River channel widths increase up to 150 feet with an average water depth

of two to six feet. The major tributary joining Beaver Creek in this stream section is Victoria Creek (wild river mile 111). Gravel bars are broad and more frequent. The river substrate, while predominately a mixture of gravels and sand, contains more silt than the first 100 river miles. The overall water quality of the river remains excellent.

A detailed description of the upper Beaver Creek drainage was reported by Rhine (1985) and Kretsinger (1986).

SPECIES PRESENT

Anadromous and resident fish species occur in Beaver Creek drainage. Only limited data are available for arctic grayling and almost none exist for other species. Fish species found in the streams which lie within boundaries of the White Mountains National Recreation Area include arctic grayling, round whitefish, burbot, sheefish, northern pike, slimy sculpin, longnose sucker, chinook salmon and chum salmon. Scientific names of the species found are listed in Appendix 1.

METHODOLOGY

Inventories and monitoring of Beaver Creek index sites were conducted at the following wild river miles (WRM):

	WRM
Borealis Cabin	32.0
Groundwater Springs	39.0
Fossil Creek	46.0
Willow Creek	88.0
Sheep Creek	90.5
Warren Creek	98.5
Victoria Creek	111.0

A. Water quality parameters related to fish habitat and fish populations were recorded at each of the above seven index sites on Beaver Creek.

B. Aerial reconnaissances of Beaver Creek recreational use were made between Victoria Creek (WRM 111, Figure 1) and the origin of Beaver Creek (WRM 0, Figure 1). Ten time frames were selected at random between 8 a.m. and 5 p.m. A survey was conducted every ten days after June 1. The 1988 aerial surveys covered June 7 to September 7. A standard form was used to record the observations (Figure 2). A fixed-wing aircraft was used to make these one-hour survey overflights.

C. Field observations were made of Nome Creek drainage to determine potential areas of stream habitat enhancement opportunities. A study plot of different grasses was planted on the west side (Township 6 North; Range 5 East; Section 12 South East 1/4) of Pavey's mining operation to determine the feasibility of using grass to control surface runoff from reclaimed mine areas. Natural vegetation occurrence in these reclaimed sites was monitored. Riparian habitat and potential habitat enhancement opportunities were delineated on the Nome Creek mined areas and tailings.

D. Fish movements and overwintering areas were determined using radio-tagged grayling. Movements were monitored by fixed-wing aircraft.

E. Field observations on lakes in the White Mountains National Recreational Area were conducted for potential recreation fishing sites. Configurations of two lakes are listed in Figures 3 and 4.

Transportation to and from sampling sites was provided by a Cessna 185 fixed-wing aircraft, a 206 L1 Long Ranger helicopter, a snow machine and a four-wheel drive vehicle as needed. Beaver Creek was floated using a Campways Hopi rubber raft.

Salmon and grayling fish populations were observed. Grayling were sampled and captured using hook and line. Fish were measured and weighed. Adult fish were measured in fork length (FL) and recorded in millimeters (mm). Juvenile fish, when captured, were measured in total length (TL) and recorded in millimeters. Weights were recorded in ounces, then later converted to grams. The K factor (degree of well being) was computed for fish taken for scale samples and age determination.

Scale samples collected were cleaned with detergent, mounted, placed on acetate strips and pressed. Age was determined later, using a Microfiche reader.

Water quality parameters were measured using a Hach water chemistry kit, Model AL36-B. Turbidity was measured with a portable H. F. Scientific turbidimeter, Model DRT-15. Stream velocities and discharge, when recorded, were taken with the velocity head rod method. Photos were taken of the sampling sites with a 35mm Pentax camera. Field notes and data were documented on notebooks and special forms for the surveys. Field data are stored in a computer and in files at the Steese/White Mountains District Office.

RESULTS

A. Seven index sites were sampled from June 20 to 27 in 1988. Water quality analyses were conducted in the field. Turbidity readings of the field samples were analyzed in the lab. Table 1 lists the water quality parameters sampled.

Table 1. Water Quality Readings of Beaver Creek Index Sites–June 1988

Index Stations	PARAMETERS pH	Total Alkalinity*	Total Hardness*	Turbidity (NTU)	Dissolved Oxygen**
WRM 32.0	6.6	0	4.0	.13	9.0
WRM 39.0	6.8	0	4.0	.15	10.0
WRM 46.0	7.2	0	8.0	.11	10.0
WRM 88.0	7.0	0	7.0	.11	8.0
WRM 90.5	7.1	0	12.0	.12	9.0
WRM 98.5	7.0	0	7.0	.15	9.0
WRM111.0	7.3	0	11.0	–	8.0

* grains per gallon
** mg/l
WRM= wild river mile

Fish Sampling

A total of 181 grayling (*Thymallus arcticus*) were captured by hook and line throughout the survey of the seven index sites. Fifty-eight fish were sacrificed for sex determinations, scale samples, and length and weight measurements.

The captured fish ranged from 140 to 368 mm in fork length (5.5-14.5 inches) and ranged from 28.35 to 510.3 grams in weight (1-18 ounces). Average fork length was 264 mm and average weight 220 grams.

The sex ratio was 36 percent males and 64 percent females. Males ranged from 178 to 330 mm in fork length (average 260 mm) and 71 to 368 grams in weight (average 191 grams). Females ranged from 216 to 368 mm in length (average 305 mm) and from 113.4 to 510.3 grams in weight (average 276 grams).

The K factor of the fish sampled was calculated for each index site and areas between sites. The K factor is the relationship of the length and weight of fish. The weight of a fish varies with the cube of its length, provided the shape and specific gravity remain the same. Generally a result above 1.0 reflects good condition or well being. K factor is used to express relative robustness of fish and indicates the suitability of an environment for fish. The fork length ranges and averages are listed. The summary is shown on Table 2 below.

A total of 181 grayling were captured by hook and line sampling. Each index site was sampled for one hour. The areas between each site was sampled randomly for a total of five hours. Sampling resulted in a catch rate of 15.1 fish per hour. No fish were captured at wild river mile 111.0 because of shallow water and few pools within the index site.

Table 2. Total number of grayling (*Thymallus arcticus*) taken, fork length and average K Factor for each index site-1988.

Index Station (WRM)	Number of Fish	Length		K Factor (Average)
		Size Range (mm)	Average Size (mm)	
32.0	34	178-267	235.5	1.3
39.0	12	140-253	206.0	1.0
46.0	62	253-343	271.0	.96
88.0	57	228-362	274.0	1.3
90.5	4	278-319	300.0	.94
98.5	12	228-371	296.25	1.2
111.0	0	–	–	0
Total	181			

WRM= wild river mile

An age frequency and fork length analysis was prepared for the grayling captured in the June survey, calculated for all index sites together as a whole. Mean lengths, percent and standard deviation for each age class is presented in Table 3. Scales from three grayling could not be read because their scales used in the analysis were regenerated. Age class determinations were made for 55 grayling.

Table 3. Age frequency and fork length of grayling (*Thymallus arcticus*) captured in Beaver Creek in the White Mountains National Recreation Area, June 20-27, 1988.

Age Class	No. Fish	Length (mm) Mean	Range	Percent of total	Standard Deviation
2	2	140	140	4	0
3	3	178	152-203	5	31.2
4	3	212	203-216	5	9.2
5	15	142	216-267	27	17.3
6	13	273	229-318	24	28.1
7	12	299	254-330	22	26.3
8	5	325	305-356	9	23.8
9	2	365	362-368	4	6.0
Total	55			100	

B. Aerial surveys to record recreation use on Beaver Creek resulted in a total of eight flights of one hour each. Two flights were not made due to inclement weather. Thirty-six people were counted in 14 parties, for an averageof 2.6 people per party. The use time frame from June 1 to September 15 covered a total of 107 days.

Eight hours of survey multiplied by 2.6 people per party equals 20.8 people; 20.8 people multiplied by 107 days represents an estimated 2,226 hours of recreational use during the time frame. Table 4 depicts the user counts for 1988.

Table 4. Beaver Creek aerial survey, user counts for 1988.

Date	1= Weekday 2= Weekend	Section	Time	Count		
				People	Watercraft	Aircraft
June 7	1	A	1600	2	1	0
June 17	1	B	0900	0	0	0
June 27	1	B	1500	6	3	0
July 7	1	A	1200			
July 17	2	B	1300	6	0	3
July 27	1	A	0800	0	0	0
August 7	1	A	1700			
August 17	1	B	1100	4	1	1
August 27	2	B	1400	4	1	1
Sept. 7	1	A	1000	14	4	2
			Mean	4.5	1.3	0.9
			Standard Deviation	4.8	1.6	1.3

While surveying use during July and September, observations were made for salmon movements in Beaver Creek (Figure 1). Clarity of water and sunny days provided good observations in the later part of July. Two chum salmon were observed at wild river mile 70 on July 27. These were possibly migrating, since spawning generally occurs late in August or September. A chinook salmon was sighted July 21 by Leroy Schebal in front of his cabin at wild river mile 46. Salmon could not be observed after July 27 because turbid water and cloudy days made observations of fish in Beaver Creek unproductive.

C. Water quality samples were collected from Nome Creek on August 3. Two samples were taken in the Maze section at the head and lower sites (Township 6 North;Range 5 East; Sections 19, 20 -- same sites as in 1987, Figure 1, A). Results are listed on Table 5.

Table 5. Nome Creek water quality readings from the Maze Section - August 3, 1988.

Sample Site	DO_2 (mg/l)	CO_2 (mg/l)	pH	Total		Turbidity	Flows
				Alkalinity*	Hardness*	(NTU)	(cfs)
Head of Meander	9.0	0.0	6.9	0.0	4.0	0.0	NM
End of Meander	5.0	5.0	6.9	0.0	3.0	0.0	NM

* grains per gallon; DO_2 – dissolved oxygen; CO_2 – carbon dioxide; NM – not measured

The dissolved oxygen and carbon dioxide readings varied between the head and the end of the meander. Since only one sample was taken from these areas in 1988, the cause of the variation cannot be ascertained at this time. In general, readings were about the same as in 1987.

Some reclamation studies were conducted during the summer of 1988. These extended into two additional sites, Hope and Birch creeks, outside of Nome Creek drainage. Three reclaimed placer mine sites within these creeks were planted with grass test plots in June 1988. Each site was planted with 50 species of grass, both native and domestic, to determine feasibility of using grass to reduce surface runoff and to revegetate mine sites. This work is being done in conjunction with the State of Alaska, Department of Natural Resources, Plant Material Center. Evaluations made by the Plant Material Center on August 23, 1988, indicated that grass can provide vegetative cover (see Appendix 2). Evaluation data collected after the first growing season is limited to recording percent cover and vigor for each taxa. Additional data will be collected in subsequent years.

The vigor ratings are based on a scale of 1-9, with 1 representing the highest rating. Many plantings that appear to be particularly successful after one growing season will be lost during the winter or will perform poorly in subsequent years. Many native grass species not performing well at this time will do better in later years. Native grasses are known for not exhibiting much vigor during their seedling years. Refer to Appendix 2.

Continued evaluation of plots for several more years is necessary to adequately determine which grasses will best revegetate the mine tailings. Grass variety and species are listed in Appendix 2.

D. The two grayling radio-tagged September 23, 1987, were monitored through the first part of May 1988. It took 24 days after tagging for the fish to travel downstream 30 miles to the overwintering area. These fish overwintered about one mile below the confluence of Trail and Beaver Creeks (Township 6 North; Range 2 East; Section 4). Both fish were still in the overwintering site on May 10. Ice was still on most of the Trail Creek section. Radio signals from the tags were weak or barely discernible.

E. The two lakes examined (Figures 3 and 4) in 1987 were slated to be tested in the winter of 1988 for dissolved oxygen, but only Colorado Creek Lake was tested (April 6). It had 3.5 feet of ice cover over 5.5 feet of water at the test site. The dissolved oxygen reading was 6.5 ppm in 1988. The ice was clear for the most part, with three to four inches of snow over the lake. The other lake near Mt. Prindle could not be located because the large snow field, several feet deep, covered the lake and testing for dissolved oxygen was not feasible.

DISCUSSION

Habitat surveys made during 1986 (Van Haveren et al.) and 1988 documented available fish habitat for anadromous and resident fish species in Beaver Creek. Most of the habitat appears to be more suitable for resident species based on the presence of grayling throughout the Beaver Creek drainage.

Water quality data was sampled for each index site. The parameters sampled and recorded for Beaver Creek (1986-1988) are typical of streams within the Tanana uplands. Water quality samplings conducted from 1986 to 1988 are the first documented results for this stream and indicate that it is suitable for fish.

Test netting of fish populations at these sites was not conducted because of low water levels and heavy beaver activity in all index sites. Only hook and line sampling was conducted for grayling. Most of the grayling captured appeared to be adults. Based on the mean-average size these are 2- to 9-year-old grayling, compared to those of Bear and Quartz Creeks (Rhine, 1985 and Kretsinger, 1986).

Recreation use reported in 1986 (Van Haveren et al.) covers a handful of trips per year with a total of 30 people. There are no records of visitor use to provide a basis to sample from; however, aerial survey efforts were initiated in 1987 to gather recreational use data on Beaver Creek.

The proposed recreational development of the White Mountains National Recreation Area--increased road access (1991), trails, overnight camping areas, picnic areas and river access for Beaver Creek--can be expected to increase recreational use and fishing activity in this area. Increased fishing pressure may lead to a greater harvest of grayling and impact the population of older age classes (5- to 9-year-olds) or spawning adult fish. Determinations of a threshold level for the Beaver Creek grayling could not be made due to small sample size in 1988, only seven days worth of data, and selective fishing with hook and line. A recommendation to the Alaska Department of Fish and Game for changes in creel limits and fish management practices may be necessary to protect fish populations and provide for a sustained yield of grayling for anglers.

Observations made on chinook and chum salmon in July 1988 indicate a range extension of 31 miles for chinook salmon and 41 miles for chum salmon in Beaver Creek. These range extensions are significant because they delineate stream habitat that may potentially be used by salmon for part of their life history. Also, documentation of these fish observations are the first known records in Beaver Creek above

Victoria Creek.

Water quality data were collected in initial surveys in June and July 1987 on Nome Creek. Only one set of samples was collected in August 1988.The data indicated good-quality water for fish species; however, examination of substrate made in 1987 and 1988 revealed that each sampling site was covered with sediment. Examination of the sampling sites in the tailings meander section revealed sediment deposition on the stream substrate. It appears that seasonal runoff from the adjacent land surface doesn't have adequate flow to carry silt-laden water through this section of stream. Also, the channel conformity reduced stream flows, which then increased deposition of sediment in this area.

Several sites were examined for potential stream enhancement work (Post, 1986), in conjunction with recreational development. Gabions and other deflecting structures could be used to direct the two to four different channels into one channel to concentrate the flow, increase the velocity, flush the sediments from the substrate and provide additional gravel spawning beds.

The upper Pavey mining area has been reclaimed, but in 1988 the mining operation was started again on the east side of the claim. Prior to reseeding or revegetating the area, observations were made of selected study plots. The natural vegetation recovery was also noted.

A grass study plot was established on the west side of Pavey's mining operation. The results indicate grasses have good potential to provide cover for control of surface runoff; however, more evaluations will be needed before expanding the use of grass seeding on reclaimed areas of Nome Creek.

Two radio-tagged grayling traveled about 30 miles to a documented overwintering site (Webb, 1982) in Beaver Creek. It is not known if they migrated upstream to spawn because their weak signals were last read May 10, 1988.

Colorado Creek Lake may provide summer fishing when new trails and access sites are developed. Backpackers, fishermen and hunters may be able to enjoy using of this lake if dissolved oxygen levels support fish during the winter months. The Alaska Department of Fish and Game will stock fish depending on the analysis of winter dissolved oxygen samples.

RECOMMENDATIONS

The BLM (Steese/White Mountains District) will update the draft White Mountains Aquatic Habitat Management Plan, a supplement to the Master Habitat Management Plan, in 1990 for concurrence and approval by management and the Alaska Department of Fish and Game. This plan will also provide data to update the Beaver Creek River Management Plan (scheduled for 1992) as related to the fisheries resources. Rrecommendations follow.

1. Conduct water quality surveys annually in each of the seven index sites to measure any changes that may occur and determine if they relate to land use activities (recreation, road building, mining). The data will be used to measure and compare possible impacts to the fisheries resources.

2. Survey each index site annually, utilizing three or more types of fish sampling gear to increase the likelihood of recording additional fish species not previously recorded. This will provide comparative

data for ascertaining species composition, population densities and threshold levels for sustaining harvestable populations of grayling. Data will provide for a larger sample size to determine percent of spawners, age classes, sex ratios and K factor of grayling populations.

3. Continue aerial reconnaissance monthly from June to September each year to record recreational uses of Beaver Creek drainage. These records will provide data to make comparative measurements of recreational use for the past (1987-1988), present and future, during and following road development for recreational access into upper Beaver Creek. Emphasis will be placed on using these recreational overflights to record salmon movements, dates of observation, and habitat where sighted. The addition of three or more flights to the seasonal surveys will improve documentation of salmon use of the available habitat in this stream.

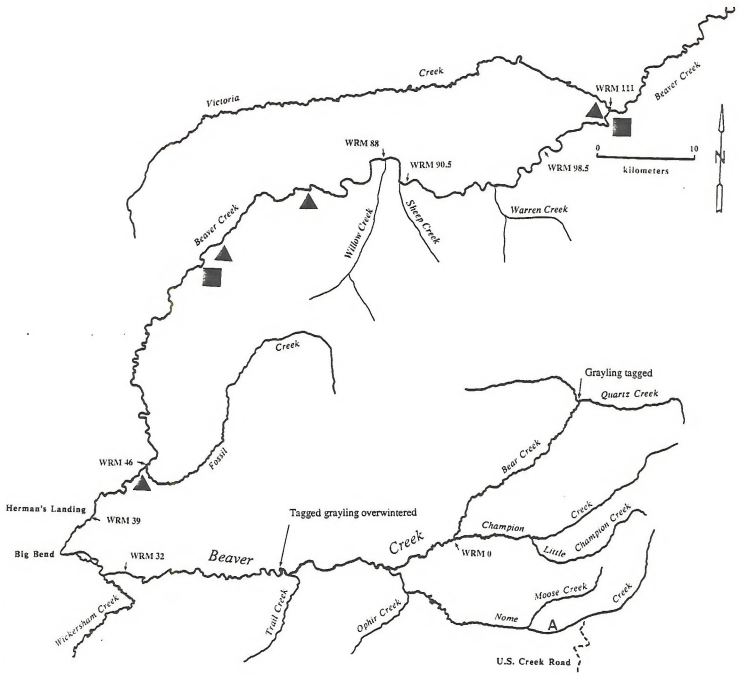
4. Continue water quality and substrate sampling annually within the Maze section (Figure 1, A) and other tailings sites in Nome Creek for comparative determination of road and mining impacts to the fish habitat and to document effects of rehabilitation efforts. Measure stream flows using the expertise of the district hydrologist.

5. Prepare and implement plan for channel adjustments in the upper Nome Creek to increase flows and reduce sediment deposition within the Maze section. Aerial photos of Nome Creek will provide reference source for enhancement work in the creek. In FY 1991, $67,000 has been requested by watershed to rehabilitate the Bluff section (Figure 1, A) of Nome Creek. Fisheries resource management will be involved in that project. Also revegetation of abandoned mine sites and the Maze section within this stream will be done using domestic and native plant species for riparian habitat improvements.

6. Expand the fish tagging activity using both plastic streamer tags and radio tags to monitor movements, overwintering areas, spawning and feeding habitat in Beaver Creek for grayling and other resident species. Tagging will provide data for comparative purposes in habitat conditions and fish utilization of stream habitat in subsequent years. The operations will begin in April 1989 and progress through the fall. This operation will be conducted on an annual basis.

7. Sample winter dissolved oxygen levels in Colorado Creek Lake in March and April 1989 to determine if levels are suitable for fish. Oxygen readings for supporting fish life should be about one part per million. If dissolved oxygen levels are suitable, the lake outlet may be screened. The screen will prevent stocked fish from possibly contaminating native fish in Beaver Creek drainage with diseases. The fish will be stocked by the Department of Fish and Game.

Figure 1. Survey sites by wild river miles (WRM) and 1987-88 salmon observations in Beaver Creek.



Chum Salmon

Chinook Salmon

WRM Wild River Mile

Figure 2. Field Survey Form for User Count, Beaver Creek in the White Mountains National Recreation Area (an example).

1988

Beaver Creek Aerial Survey User Counts

Dates	Starting	Time a.m.	Time p.m.	Counts
06/07	A		4:00	One canoe, two people below Borealis cabin.
06/17	B	9:00		
06/27	B		3:00	
07/07	A	8.00		
07/17	B		1:00	3 aircraft-6 people: 1 ac Borealis, 2 ac Shebal's camp
07/27	A	12 noon		
08/07	A		5:00	
08/17	B	11:00		1 riverboat, 1 ac; 2, people each. Willow & Warren Creek
08/27	B		2:00	1 raft/2, 1 riverboat/2 sheep hunting near Willow Creek
09/07	A	10:00		2 ac/4 people. 4 watercraft/7 people. 1 party/3**

** horseback - moose hunting. Watercraft above Big Bend possably hunters. Aircraft at Herman's, other on bar at Warren Creek area.
ac = aircraft

Nome Creek to Victoria Creek = Section A
Victoria Creek to Nome Creek = Section B

Efforts should be made to fly the time and day scheduled. However, weather may require moving the flight either forward or backward by a day. Flight should be on the designated time.

Figure 3. Depth chart for Colorado Creek Lake, White Mountains National Recreation Area

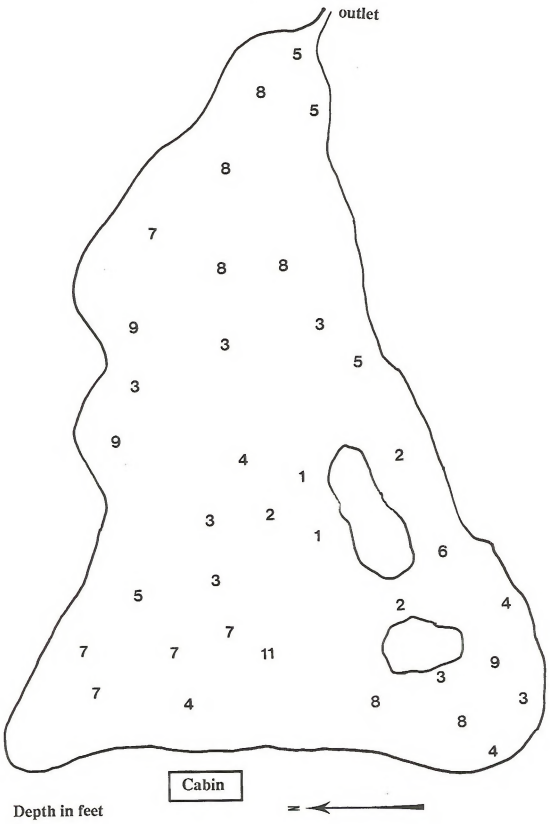
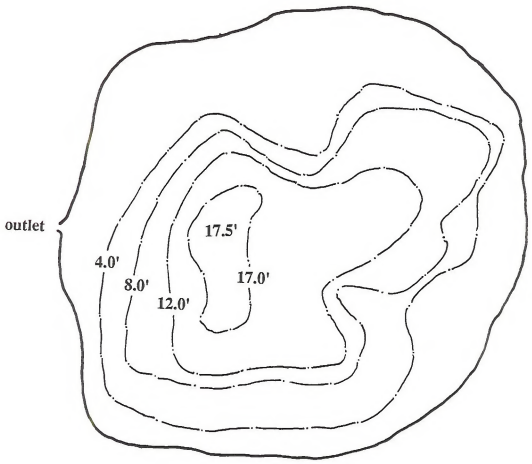


Figure 4. Unnamed alpine lake near Mount Prindle, White Mountains National Recreation Area.



Drawing is not to scale: Lake is approximately 800' around

Appendix 1. Scientific names of fish present in Beaver Creek, White Mountains National Recreation Area.

Arctic grayling	*Thymallus arcticus*
Round whitefish	*Prosopium cylindraceum*
Burbot	*Lota lota*
Sheefish	*Stenodus leucichthys*
Northern Pike	*Esox lucius*
Slimy sculpin	*Cottus cognatus*
Longnose sucker	*Catostomus catostomus*
Chinook salmon	*Oncorhynchus tshawytscha*
Chum salmon	*Oncorhynchus keta*

Appendix 2. Grass varieties/species in test plots, White Mountains National Recreation Area.

GRASS VARIETY/SPECIES	HOPE CREEK		BIRCH CK#1		BIRCH CK#2		NOME CK	
	% cover	vigor	% cover	vigor	% cover	vigor	% cover	vigor
Nugget Kentucky Bluegrass	25	5	50	5	50	3	50	4
Merion Kentucky Bluegrass	20	5	60	4	50	2	80	2
Banff Kentucky Bluegrass	30	4	90	1	30	5	75	3
Park Kentucky Bluegrass	20	5	60	3	30	4	90	1
Sydsport Kentucky Bluegrass	20	5	40	5	65	1	70	3
Fylking Kentucky Bluegrass	50	3	50	4	65	2	70	3
Troy Kentucky Bluegrass	40	4	50	4	50	3		
Sherman Big Bluegrass	40	4	75	1	50	3	75	1
Poa ampla	40	3	50	3	70	1	90	1
Canbar Canby Bluegrass	30	5	60	4	30	5	75	3
Ruebans Canada Bluegrass	50	4	40	6	70	3	80	3
Tundra Glaucus Bluegrass	40	4	80	1	60	3	80	1
Gruening Alpine Bluegrass	30	5	50	3	50	1	80	3
Poa glauca T08867	50	3	75	2	70	1	60	4
Sodar Streambank Wheatgrass	60	4	75	3	75	1	75	1
Agropyron subsecundum 371698								
Agropyron subsecundum Canada	8	5						
Nordan Crested Wheatgrass	50	3	80	3	60	1	60	1
Fairway Crested Wheatgrass	50	4	80	3	50	2	50	3
Agrophyron violaceum	10	3			15	3	20	3
Agropyron boreal	30	3	50	3	60	1	50	3
Summit Crested Wheatgrass	30	5	60	3	40	4	80	1
Critana Thickspike Wheatgrass	20	5	50	3	40	3	35	3
Agropyron yukonese	15	5			3	30	20	1
Vantage Reed Canarygrass	60	1	75	1	60	3	60	3
Fults Alkaligrass	50	3	60	1	65	3	80	3
Engmo Timothy	70	1	90	3	60	5	90	1
Climax Timothy	60	3	80	1	70	1	90	3
Elymus sibiricus 345600	70	1	60	1	75	1	90	1
Elymus arenarius	5	5	8	5	10	3	4	5
Nortran Tufted Hairgrass	60	2	60	3	70	3	80	1
Norcoast Bering Hairgrass	45	5	60	1	50	2	50	3
Calamagrostis canadensis Delta	30	3	70	1	25	4	75	1
Sourdough Bluejoint Reedgrass	20	5	40	3	40	5	60	3
Alopecurus geniculatus	70	2	90	1	85	1	90	1
Meadow Foxtail	60	3	90	3	80	3	95	1
Arctared Red Fescue	75	1	60	3	60	3	85	1
Garrison Creeping Foxtail	15	5	95	1	60	3	80	3
Festuca scabrella	60	3	60	2	70	1	90	1
Boreal Red Fescue	60	3	90	1	60	3	90	1
Pennlawn Red Fescue	50	3	75	3	70	1	60	1
Egan Sloughgrass	15	5	80	1	60	3	80	1
Highlight Red Fescue	90	2	80	4	40	5	75	2
Durar Hard Fescue	30	3	60	4	40	4	80	2
Manchar Smooth Brome	60	3	80	1	75	1	50	2
Carlton Smooth Brome	70	1	50	5	60	3	60	1
Pumpelly Brome	50	5	50	3	50	4	50	3
Covar Sheep Fescue	50	3	60	5	60	3	75	3
Alyeska Polargrass	30	4	60	3	40	5	50	3
Tellesy Sage	60	1	80	1	40	5	75	3

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BLM Mission Statement

The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple-use and sustained yield; a combination of uses that takes into account the long term needs of future generations for renewable and non-renewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness, and natural, scientific and cultural values.

BLM-Alaska Mission Statement

In Alaska, the Bureau of Land Management is responsible for carrying out the mandates of the Alaska Native Claims Settlement Act, the Alaska National Interest Lands Conservation Act, and the Alaska Statehood Act along with the Federal Land Policy and Management Act and other federal laws. These duties make cooperative management a vital necessity. BLM-Alaska's success as a public land guardian and resource manager is dependent on its ability to serve the public through mutual understanding. Sustaining a working partnership with the public is a key element of multiple use management, given the special nature of Alaska and its people. To this end, BLM-Alaska:

*exists to serve the public

*safeguards the land and ensures needed resources are available to future generations

*keeps the nations promises of the land to the Natives and the State of Alaska

*serves as an information storehouse for the public